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PATENT APPLICATION  
Mo-6021  
WW-5562

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICATION OF )  
HARTWIG SCHLESIGER ET AL ) GROUP NO.: 1614  
SERIAL NUMBER: 09/785,905 ) EXAMINER: DWAYNE C. JONES  
FILED: FEBRUARY 16, 2001 ) RESPONSE TO PAPER NO.  
TITLE: A PROCESS FOR PRODUCING ) 05282004  
PARTICULATE, WATER-SOLUBLE )  
CELLULOSE DERIVATIVES )  
USING A SUPERHEATED GAS )  
MIXTURE CONTAINING STEAM )

**LETTER**

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Enclosed herewith are three copies of an Appeal Brief in the matter of the subject Appeal. Please charge the fee for filing the Brief, \$340.00, to our Deposit Account Number 13-3848.

Respectfully submitted

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Date  
James R. Franks, Reg. No. 42,552  
Name of applicant, assignee or Registered Representative

James R. Franks  
Signature  
November 2, 2004  
Date

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

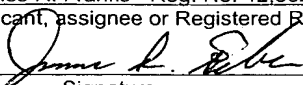
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| APPLICATION OF                 | )                           |
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| HARTWIG SCHLESIGER ET AL       | )                           |
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|                                | ) 05282004                  |
| TITLE: A PROCESS FOR PRODUCING | )                           |
| PARTICULATE, WATER-SOLUBLE     | )                           |
| CELLULOSE DERIVATIVES          | )                           |
| USING A SUPERHEATED GAS        | )                           |
| MIXTURE CONTAINING STEAM       | )                           |

**APPEAL BRIEF**

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Brief, submitted in triplicate, is an appeal from the Final Office Action of the Examiner dated June 3, 2004 in which the rejections of Claims 1-8 were maintained.

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James R. Franks - Reg. No. 42,552  
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Signature \_\_\_\_\_  
November 2, 2004  
Date \_\_\_\_\_

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### **I. REAL PARTY IN INTEREST**

The real party in interest is Wolff Walsrode, AG.

### **II. RELATED APPEALS AND INTERFERENCES**

There are no other related appeals or interferences known to Appellants, Appellants' legal representative, or Appellants' assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

### **III. STATUS OF THE CLAIMS**

|   |      |
|---|------|
| Claims Pending:                         | 1-8  |
| Claims Canceled:                        | 9-14 |
| Claims Allowed:                         | None |
| Claims Withdrawn<br>from Consideration: | None |
| Claims Appealed:                        | 1-8  |

### **IV. STATUS OF AMENDMENTS**

No amendment has been filed subsequent to the outstanding final rejection.

### **V. SUMMARY OF THE INVENTION**

The present invention is directed to a process for producing particulate water-soluble cellulose derivatives, comprising:

- a) forming a feed composition comprising a cellulose derivative, and 50 wt. % to 80 wt. % of water, based on the total weight of the feed composition, wherein the cellulose derivative is at least one of swelled and dissolved in the feed composition;

- b) contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from,
  - (i) a superheated gaseous mixture of steam and an inert gas, and
  - (ii) a superheated gas mixture of steam and air,thereby converting the cellulose derivative of the feed composition into a solid state form of finely particulate particles, wherein the superheated gas mixture has a steam content of 40 wt. % to 99 wt. %, based on the total weight of the superheated gas mixture;
- c) separating the particulate cellulose derivative from the superheated gas mixture; and
- d) optionally drying the particulate cellulose derivative.

#### **VI. ISSUES**

(I) Whether any of Claims 1-8 are unpatentable under 35 U.S.C. §103(a) over WO 98/31710 (**Weber et al**) in view of UK Patent Application No. GB 2,262,527 A (**Bujara et al**).

#### **VII. GROUPING OF CLAIMS**

Claims 1-8 are appealed together. Claims 1-8 stand or fall together.

#### **VIII. ARGUMENTS**

(I) CLAIMS 1-8 ARE NOT RENDERED OBVIOUS BY WEBER ET AL IN VIEW OF BUJARA ET AL.

The Examiner has taken the position that, under 35 U.S.C. §103(a), Claims 1-8 are unpatentable over Weber et al in view of Bujara et al. Appellants respectfully disagree with regard to Claims 1-8.

Weber et al will be referred to herein with reference to United States Patent No. 6,320,043 B1, the English language equivalent of WO 98/31710. Weber et al disclose a method of preparing particulate polysaccharide derivatives (e.g., cellulose derivatives) that have a thermal flocculation point (abstract). The process of Weber et al involves: (a) soaking or dissolving a polysaccharide derivative in an adequate quantity of solvent or mixed solvent (e.g., 35 to 99 wt.% of solvent/mixed solvent), thereby removing the primary structures of the polysaccharide derivative; (b) converting the soaked/dissolved polysaccharide derivative into a solid state in a dryer-pulverizer; and (c) optionally drying the solid polysaccharide derivative. See the abstract; and column 2, line 48 through column 3, line 6 of Weber et al.

The solid state conversion step-(b) is disclosed by Weber et al as involving the conversion of the solvent or mixed solvent, in which the polysaccharide derivative is soaked/dissolved, into the vapor phase by means of contact with a superheated vapor of the corresponding or a different solvent/mixed solvent in a dryer-pulverizer. See column 2, lines 55-60 of Weber et al. Weber et al disclose using a superheated vapor of a solvent/mixed solvent (e.g., superheated steam) as the heat-transfer and transport gas in the mill (column 5, lines 29-39).

Appellants respectfully submit that, contrary to the Examiner's position, Weber et al does not disclose, teach or suggest performing their solid state conversion step using a superheated gas mixture of steam-inert gas or steam-air, having a steam content of 40 to 90 wt.%. Appellants more particularly submit that the Examiner's contention, on page 3 of the Office Action of 3 June 2004, that heating water to 100°C or above results in the formation of steam or water vapor comprising gaseous water molecules that are mixed with air molecules, is wrong. By definition, steam is gaseous H<sub>2</sub>O (i.e., it is composed of 100% water molecules). See, for example, pages 719-20 of volume 22 of KIRK-OTHMER, ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY (4th ed. 1997), which is included herewith in Appendix-II.

For purposes of illustration, 100 ml of water at 20°C can dissolve a total of 104 ml of oxygen, nitrogen and carbon dioxide. Upon vaporization, 100 ml of such water will yield 124 liters of gaseous water, thus containing less than 0.1% of other gasses {  $(0.104 \div 124) \times 100 = 0.08\%$  }.

Thus, Weber et al's disclosure of superheated steam, without more, refers to a gas composed of essentially 100% water molecules, as would be recognized by a skilled artisan. Further, Weber et al's disclosure relating to superheated steam does not extend to or reasonably touch upon Appellants' claimed process, which makes use of a superheated gas mixture of (i) steam-inert gas or (ii) steam-air, containing 40 to 99 wt.% of steam.

Appellants further submit that the Examiner has mischaracterized Weber et al. The combination of superheated steam and the soaked/dissolved polysaccharide derivative of Weber et al would not result in the formation of a superheated gas mixture of steam and vaporized solvent(s), because the superheated steam would no longer be superheated after contact with the soaked/dissolved polysaccharide derivative. Weber et al provides no disclosure or suggestion with regard to (i) reheating the co-product vapor and/or (ii) re-introducing a reheated co-product vapor stream back into the dryer-pulverizer.

In light of the preceding, the Examiner's remarks concerning Weber et al's disclosure of the polysaccharide derivative being dissolved/soaked in 35 to 99 wt.% of solvent/mixed solvent is deemed to be moot, and does not reasonably extend to or touch upon the merits of Appellants' claimed process. Such disclosure by Weber et al does not represent or reasonably suggest the use of a superheated gas mixture of (i) steam-inert gas or (ii) steam-air, containing in each case 40 to 99 wt.% of steam.

Bujara et al disclose a process for grinding cellulose compounds that involves drying and grinding a cooled and gelled cellulose compound, having a water content of 30 to 80 wt.%, in an impact mill. A gas stream, such as air, is also introduced into the mill at a temperature of, for example, 20 to 250°C. See the abstract; and page 10, line 24 through page 11, line 3 of Bujara et al.

Appellants respectfully submit that the Examiner has mischaracterized Bujara et al, in particular with regard to his contention that Bujara et al discloses or suggest that contact between the heated gas stream and the cooled-gelled cellulose compound would result in the formation of a superheated mixture of gasses. Upon contact with the cooled-gelled cellulose compound of Bujara et al, the heated gas

stream is dramatically cooled, as would be recognized by a skilled artisan. As such, the resulting mixture of gasses, if any, would not be superheated. Bujara et al provide no disclosure or suggestion with regard to (i) re-heating the co-product gasses (of the drying-grinding step) and/or (ii) re-introducing re-heated co-product gasses back into the impact mill. As such, Bujara et al provide no disclosure, teaching or suggestion with regard to contacting, in an impact mill, a swelled/dissolved cellulose derivative containing 50 to 80 wt.% of water with a superheated gaseous mixture of (i) steam-inert gas or (ii) steam-air, containing 40 to 99 wt.% steam.

Weber et al disclose a process that includes the step of converting a soaked/dissolved polysaccharide derivative into a solid state by using a superheated vapor, such as superheated steam. Weber et al does not disclose or suggest using a less than superheated gas stream (e.g., a merely heated gas stream). Bujara et al disclose drying and grinding a cooled-gelled cellulose compound containing 30 to 80 wt.% water in an impact mill, into which is concurrently fed a gas stream, such as air, that may be heated. Bujara et al does not disclose or suggest the use of a superheated vapor, such as superheated steam. As such, neither Weber et al nor Bujara et al provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their respective disclosures.

As the Court of Appeals for the Federal Circuit has stated, there are three possible sources for motivation to combine references in a manner that would render claims obvious. These are (1) the nature of the problem to be solved, (2) the teaching of the prior art, and (3) the knowledge of persons of ordinary skill in the art, *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). The nature of the problem to be solved and the knowledge of persons of ordinary skill in the art are not present here and have not been relied upon in the rejection. As for the teaching of the prior art, the above discussion has established that neither of the patents relied upon in the rejection provide the requisite teaching, and certainly do not provide the motivation or suggestion to combine that is required by Court decisions.

Even if Weber et al and Bujara et al were combined, Appellants' claimed process would not result from such combination, but for the impermissible

application of hindsight reconstruction. As discussed previously herein, Weber et al and Bujara et al, either alone or in combination, do not disclose, teach or suggest the process of Appellants' claims in which a swelled/dissolved cellulose derivative containing 50 to 80 wt.% of water is contacted, in an impact mill, with a superheated gaseous mixture of (i) steam-inert gas or (ii) steam-air, containing 40 to 99 wt.% steam.


The use of hindsight reconstruction of an invention is an inappropriate process by which to determine patentability, *In re Rouffet*, 47 U.S.P.Q.2d at 1457. To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988).

In light of the preceding remarks, Appellants' Claims 1-8 are deemed to be patentable over Weber et al in view of Bujara et al.

In view of the remarks herein, Appellants' respectfully submit that their claimed process for producing particulate water-soluble cellulose derivatives is not described, taught or fairly suggested by Weber et al in view of Bujara et al. Thus, Appellants respectfully request that the Board of Appeals reverse the decision of the Examiner, and remand the application for allowance of Claims 1-8 and issuance of a patent.

Respectfully submitted,

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Agent for Appellants  
Reg. No. 42,552



**APPENDIX-I**  
**CLAIMS ON APPEAL**

Claim 1. (Original): A process for producing particulate water-soluble cellulose derivatives, comprising:

- a) forming a feed composition comprising a cellulose derivative, and 50 wt. % to 80 wt. % of water, based on the total weight of the feed composition, wherein the cellulose derivative is at least one of swelled and dissolved in the feed composition;
- b) contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air, thereby converting the cellulose derivative of the feed composition into a solid state form of finely particulate particles, wherein the superheated gas mixture has a steam content of 40 wt. % to 99 wt. %, based on the total weight of the superheated gas mixture;
- c) separating the particulate cellulose derivative from the superheated gas mixture; and
- d) optionally drying the particulate cellulose derivative.

Claim 2. (Original): The process of Claim 1 wherein the cellulose derivative is present in said feed composition in an amount of 20 wt. % to 50 wt. %, based on the total weight of the feed composition.

Claim 3. (Original): The process of Claim 1 wherein at least one of modifiers, additives and active substances are mixed with or added to the cellulose derivative before, during or after one or more of the partial steps a) to c) of the process.

Claim 4. (Original): The process of Claim 1 wherein that the cellulose derivative is a cellulose derivative having a thermal flocculation point.

Claim 5. (Original) The process of Claim 1 wherein the cellulose derivative used to form the feed composition is in the form of a water-moist filter cake, and the water used to form the feed composition has a temperature of from 0° to 60°C.

Claim 6. (Original): The process of Claim 1 wherein the cellulose derivative is a cellulose ether.

Claim 7. (Original): The process of Claim 1 wherein a sieve-free high rotational speed gas jet impact mill is used in step b).

Claim 8. (Original): The process of Claim 1 wherein the particle-size distribution curve of the finely particulate cellulose derivative is adjusted in step b) by varying the rotational speed of the high rotational speed gas jet impact mill.

Claims 9-14. (Cancelled).

## **APPENDIX-II**

KIRK-OTHMER, ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY, Vol. 22, pp 719-20 (John Wiley & Sons, 4th ed., 1997)



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# ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY

FOURTH EDITION

VOLUME 22

SILICON COMPOUNDS  
TO  
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IV. Howe-Grant, Mary, 1943–. V. Title: Kirk-Othmer encyclopedia  
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#### General References

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JAMES R. DANIEL  
Purdue University

## STEAM

Steam [7732-18-5], gaseous  $H_2O$ , is the most important industrially used vapor and, after water (qv), the most common and important fluid used in chemical technology. Steam can be generated by evaporation (qv) of water at subcritical pressures, by heating water above the critical pressure, and by sublimation of ice. Steam is used in electric power generation (see POWER GENERATION); for driving

mechanical devices; for distribution of heat; as a reaction medium; as a solvent; as a cleaning, blanketing, or smothering agent; and as a distillation (qv) aid. It is so widely used because water is generally available and steam is easy to generate and distribute. It has high latent heat, moderate density, and, except for thermal characteristics, nonpolluting properties. Steam provides easy control of temperature in processes and heating applications because the temperature is a function of pressure, which is easy to control.

Steam is generated from water by boiling, flash evaporation, and throttling from high to low pressure. The phase change occurs along the saturation line such that the specific volume of steam is larger than that of the boiling water. Thermal energy, ie, the heat of evaporation, is absorbed during the process. At the critical and supercritical pressures, the water-steam distinction disappears, and the fluid can go from water-like properties to steam-like properties without an abrupt change in density or enthalpy. The heat of evaporation under these conditions becomes zero.

Properties of steam can be divided into thermodynamic, transport, physical, and chemical properties. In addition, the molecular structure and chemical composition of steam are of interest. It was at the start of industrialization, ca 1763, that thermodynamic relationships were first measured by Watt. A century later, in 1859, Rankine published his *Manual of the Steam Engine*, which gave a practical thermodynamic basis for the design and performance of steam engines.

The thermodynamic and physical properties of pure steam are well established over the range of pressures and temperatures used. The chemical properties of steam and of substances in steam, their molecular structures, and interactions with the solid surfaces of containments need to be more fully explored.

### Physical Properties

**Official Properties.** The physical properties of steam have long had considerable commercial importance. The expected efficiency of steam turbines depends on them. The first steam tables for practical use were based on Regnault's data (1) and began to appear toward the end of the nineteenth century. A thermodynamically consistent set of equations for fitting data was devised in 1900 by H. L. Callendar and was adopted by Mollier and others. The library of the United States National Institute of Standards and Technology (NIST) contains six different steam tables published between 1897 and 1915. The necessity of international property formulations was recognized as early as 1929, when the First International Steam Table Conference was held in London. As of this writing (1996), 12 international conferences on the properties of steam have been held. In 1972, the International Association for the Properties of Steam (IAPS) was formed. At the 12th International Conference on Properties of Water and Steam (ICPWS), IAPS changed its name to the International Association for Properties of Water and Steam (IAPWS), an association of national committees that maintains the official standard properties of steam and water for power cycle use. In the United States, the national committee is sponsored by the American Society of Mechanical Engineers (ASME).

IAPWS maintains two formulations of the properties of water and steam. The first is an industrial formulation, the official properties for the calculation

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